

ACANTHANECTES, A NEW GENUS OF TRIPLEFIN WITH TWO NEW SPECIES FROM THE SOUTHERN COAST OF SOUTH AFRICA (BLENNIOIDEI: TRIPTERYGIIDAE)

by

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ABSTRACT. - *Acanthanectes* gen. nov. with two species, *A. hystrix* sp. nov. and *A. rufus* sp. nov., is described. The genus is distinguished by having four spines in the first dorsal fin, a single anal-fin spine, lateral branching spinelets on the spines of the dorsal fins, papillae on the head with embedded spinelets, the spinelets ankylosed to the skull and the basisphenoid reduced or absent. Comments are also made on the status of the subfamilies, the Tripterygiinae and Lepidoblenniinae, proposed by R. Rosenblatt (unpub. dissert.).

RÉSUMÉ. - *Acanthanectes* est décrit comme genre nouveau avec deux espèces nouvelles, *A. hystrix* et *A. rufus*, à partir de matériel récolté sur la côte sud de l'Afrique du Sud. Le genre se distingue par la présence de quatre épines à la première dorsale, de petites épines latérales sur les épines des dorsales, et une seule épine anale. Des papilles contenant de petites épines sont présentes sur la tête et les petites épines sont attachées au crâne. Le basisphénoïde est réduit ou absent. Nous commentons aussi le statut des deux sous-familles, Tripterygiinae et Lepidoblenniinae, proposé par R. Rosenblatt.

Key-words. - Tripterygiidae, Tripterygiinae, Lepidoblenniinae, *Acanthanectes hystrix*, *A. rufus*, PSW, South Africa, Taxonomy, New genus, New species.

Much of the coastline between Cape Agulhas and Port Elizabeth is rugged, with long stretches of rocky shoreline. This is particularly true of the Tsitsikamma Coast which consists entirely of rocky cliffs. The climatic conditions may also be described as rugged, the coast being swept for much of the year by a succession of anticyclonic fronts generated in the south Atlantic Ocean. These conditions have not been conducive to subtidal ichthyological research and, until recently, the fauna was poorly known. Although recent surveys have redressed this problem to a considerable degree (Buxton and Smale, 1984; Burger, 1990), it was not particularly surprising to find two new species of tripterygiid in these waters.

The first specimen of *Acanthanectes rufus* was collected off Cape Recife in 1981 by P.C. Heemstra of the J.L.B. Smith Institute of Ichthyology. Subsequent specimens were collected off the Tsitsikamma Coast in 1989 and 1990. *A. hystrix* was first collected at Grootbank just outside the Tsitsikamma National Park in 1991. A search through collections of *Cremnochorites capensis* (Gilchrist and Thompson, 1908) revealed most of the material of *A. hystrix*, these two species being very similar in appearance.

The purpose of this paper is to describe a new genus and species for the material.

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MATERIALS AND METHODS

Acanthanectes hystrix

Holotype. - RUSI 36688, male (31.3 mm); Soutrivier (23°54'19"E, 34°01'42"S), Tsitsikamma National Park; depth 24 m; coll. C.D. Buxton *et al.*, 21 Nov. 1990, Station 3.

Paratypes (unless otherwise noted all material collected by C.D. Buxton *et al.*). - AMS I.33646-001 (31.0 mm); the Knoll, Tsitsikamma National Park; depth 16 m; coll. 17 Mar. 1989, Station S5.- NMNZ P.29420 (28.5 mm); Cape Recife, about 400 m offshore; depth 19-20 m; coll. 19 Mar. 1981.- RUSI 36691 (3 spms, 24.8-27.3 mm); same collection as holotype.- RUSI 36692 (24.3 mm); Soutrivier, 5 km west of Tsitsikamma National Park; depth 24 m; coll. 21 Nov. 1990, Station 1.- RUSI 36693 (2 spms, 18.2, 21.0 mm); Storms River, Tsitsikamma National Park; depth; coll. P.C. Heemstra 25 Jul. 1980.- RUSI 36694 (3 spms, 23.4-32.0 mm); Cape Recife, about 400 m offshore; depth 19-20 m; coll. 7 Jan. 1981.- RUSI 36695 (31.2 mm); Soutrivier, 5 km west of Tsitsikamma National Park; depth 20 m; coll. 13 Nov. 1990, Station 2.- RUSI 36697 (3 spms, 23.4-30.5 mm); Soutrivier, 5 km west of Tsitsikamma National Park; depth 10 m; coll. 15 Aug. 1990, Station 'Aug. 1 outside'.- RUSI 36699 (28.6 mm); Soutrivier, 5 km west of Tsitsikamma National Park; depth 20 m; coll. 22 Nov. 1990, Station 1.- RUSI 37318 (26.7 mm); Soutrivier, 5 km west of Tsitsikamma National Park; depth 20 m; coll. 21 Nov. 1990, Station 2.- USNM 326000 (2 spms, 32.8, 35.0 mm); Steilkop Reef, Tsitsikamma National Park; depth 23 m; coll. 28 May 1990, Station 2.- RUSI 42483 (30.5 mm); Grootbank, 5 km west of Tsitsikamma National Park; depth 18 m; coll. J. Allen *et al.*, 6 Jan. 1993.

Acanthanectes rufus

Holotype. - RUSI 36689, male (35.5 mm); Steilkop Reef (23°54'30"E, 34°01'40"S), Tsitsikamma National Park, South Africa; depth 20-25 m; coll. C.D. Buxton *et al.*, 28 May 1990, Station 2.

Paratypes. - AMS I.33647-001 (28.3 mm); Steilkop Reef, Tsitsikamma National Park; depth 20-25 m; coll. 29 May 1990.- NMNZ P.29421 (29.5 mm); Grootbank, 5 km west of Tsitsikamma National Park; depth 18 m; coll. 21 Nov. 1990, Station 3.- RUSI 13416 (cleared and stained) (29.0 mm); 1km SW of Cape Recife, Algoa Bay; depth 19-20 m; coll. P.C. Heemstra and M.J. Smale, 7 Jan. 1981.- RUSI 36701 (2 spms, 1.7, 32.5 mm); Steilkop Reef, Tsitsikamma National Park; depth 20-25 m; coll. 28 May 1990, Station 1.- RUSI 36702 (16.2 mm); Fountain Rocks, Port Alfred; depth 15 m; coll. G. Musson, 23 Mar. 1989.- RUSI 36703 (2 spms, 28.6, 32.5 mm); same collection as holotype.- USNM 326001 (2 spms, 29.8, 30.3 mm); same collection as holotype.

Measurements were made as in Hubbs and Lagler (1958); fin element counts follow Springer (1968); snout profile is measured as in Holleman (1982), and vertebral counts follow Hardy (1986). The mandibular pore pattern is given as the number of pores in the mandibular canal (dentary plus articular) on one side plus those at the symphysis plus those on the other side (see Hansen, 1986). One specimen of each species was cleared and stained by the trypsin-alizarin red technique, with alcian blue as a cartilage counterstain. Cleared and stained material of *Cremnochorites capensis*, *Notoclinops segmentatus*, *N. yaldwyni* and *N. coeruleopunctatus* was also available.

The types are lodged in the collections of the JLB Smith Institute of Ichthyology, Grahamstown (RUSI), the Australian Museum, Sydney (AMS), the National Museum of New Zealand, Wellington (NMNZ) and the National Museum of Natural History, Smithsonian Institution, Washington DC (USNM). Counts for holotypes are given in parenthesis in the descriptions.

The distribution of the species of *Acanthanectes* is shown in figure 1.

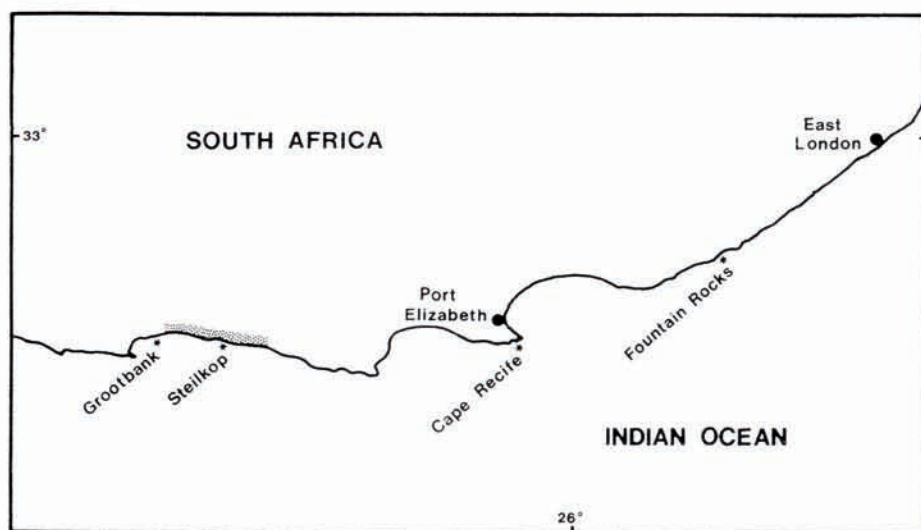


Fig. 1. - Map of eastern portion of southern coast of South Africa. Stars indicate localities where *Acanthanectes* specimens were collected.

ACANTHANECTES GEN. NOV.

Type species. - *Acanthanectes hystrix* sp. nov.

Diagnosis

First dorsal fin with four spines, anal fin with one spine; dorsal fin spines with small lateral branching spinelets (Fig. 2). Top of head papillose, each papilla with a spine embedded in it, the spine ankylosed to the skull; cheeks with papillae carrying spines or modified scales each with a few erect ctenii; ring of papillae around perimeter of eye, also with embedded spines. Lateral line discontinuous, anterior series of pored scales ending below second dorsal fin, posterior series of notched scales from below second dorsal fin to base of caudal fin. Body mostly covered with ctenoid scales, abdomen with cycloid scales.

Description

Small tripterygiid fishes, up to 35 mm SL, with a fusiform body and three dorsal fins, the first with four spines, the second with 12 to 15 spines, the third with 9 to 11 rays, the last divided to its base. Anal fin with one spine and 17 to 22 rays, the last

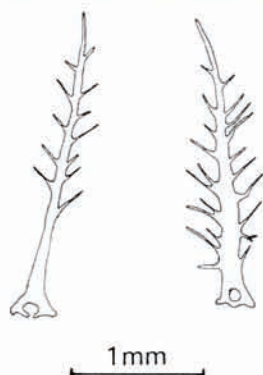


Fig. 2. - First two spines of the first dorsal fin of a cleared and stained specimen of *Acanthanectes rufus*.

divided to its base. Pelvic fins with one short, hidden spine and two slender rays. Pectoral fins with 16 or 17 rays, lowermost undivided, uppermost generally bifurcate. Spines and rays variously with small lateral branching spinelets. Lateral line discontinuous, anterior portion with 15 to 18 pored scales and posterior portion with 19 to 23 notched scales.

Body scaled with ctenoid scales, ctenii strong; belly scales cycloid. Upper portion of head with small spines of varying length embedded in papillae and ankylosed to the skull (Fig. 3 A,B). Cheeks and opercles either with modified scales carrying few ctenii or papillose with embedded spines. Rim of eye with multiple-pointed spines embedded in the skin. Ring of papillae around eye also with embedded spines. Mandibular sensory canal opens as two pores posterior to the lower jaw symphysis. Teeth in both jaws conical and depressible, a row of strong teeth on outer margin of upper jaw with band of smaller teeth behind. Single row of teeth on vomer; palatines with few teeth or edentate.

Osteology

Septal bone ossified. Basisphenoid reduced or absent. Posterodorsal margin of subopercle with spinelets (Fig. 4). Anterior and posterior ceratohyals tightly sutured.

First three pterygiophores of first dorsal fin anterior to first vertebrae, fourth pterygiophore associated with vertebra 2 and first pterygiophore of second dorsal fin between neural spines of vertebrae 4 and 5. First two or three anal-fin pterygiophores inserted anterior to first haemal spine (on vertebra 13, the first caudal vertebra). None or one free pterygiophore between second and third dorsal fins. No stay associated with last dorsal and anal fin rays. Caudal skeleton with two epurals which may be fused and a fifth hypural. Neural spine on the penultimate ural centrum long, supporting anteriormost dorsal procurent rays.

Comparisons

Although the specimens initially appeared to resemble *Ceratobregma* (Holleman, 1987), they lack the widely expanded lateral ethmoids of that genus and have four first dorsal and one anal fin spines compared to three and two of *Ceratobregma*. The superficial similarity between *Acanthanectes hystrix* and *Cremnochorites capensis* also suggested relationship and, although the two species are not congeneric, it is suggested that *Cremnochorites* and *Acanthanectes* are sister taxa. These similarities will be explored further under 'Relationships'. There is only one other genus which also possesses four first dorsal fin spines and a single anal fin spine, the New Zealand endemic, *Notoclinops*. Of the three species ascribed to this genus (Hardy, 1987, 1989) two species have no scales or papillae with spines on the head, "except for fine scales with raised ctenii on the posterodorsal rim of the orbit" (Hardy, 1987:166), and no spinelets on the dorsal fin spines. However, the third and most recently described species, *N. coerulopunctatus* (Hardy, 1989), does have spinelets on the first and sometimes second dorsal-fin spines, as well as papillae on the head with spines, but the spines are unossified and not attached to the skull bones. *N. coerulopunctatus* differs from the *Acanthanectes* species in having 30-31 caudal vertebrae compared to 23-24 for *A. hystrix* and 24-25 for *A. rufus* (*C. capensis* has 26-27 caudal vertebrae), and a fully-formed basisphenoid which articulates with the pterospheneids.

Etymology

The generic name is taken from the Greek *acanthos*, a spine or thorn, and *nectes*, a swimmer, and refers to the lateral branching spines of the dorsal fin elements. The gender is masculine.

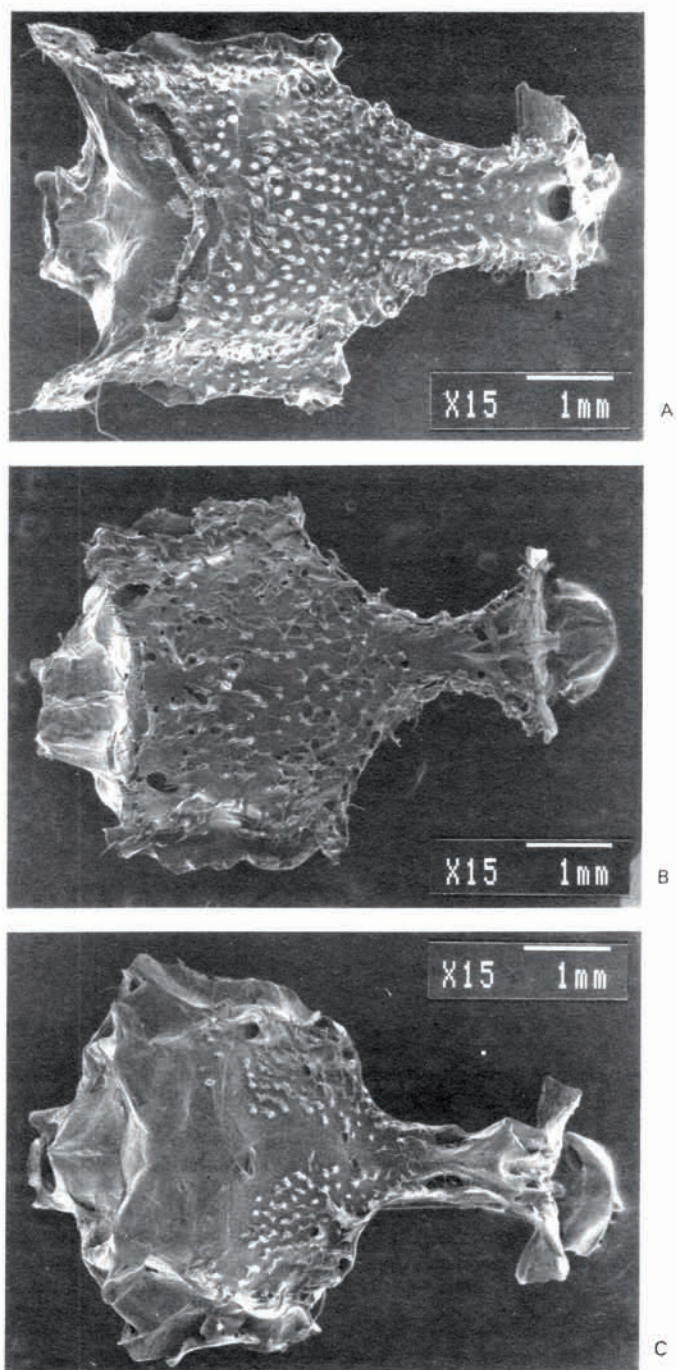


Fig. 3. - Top of skull of A) *Acanthanectes hystrix*, B) *A. rufus*, C) *Creminochorites capensis*, showing spinelets ankylosed to the bone.

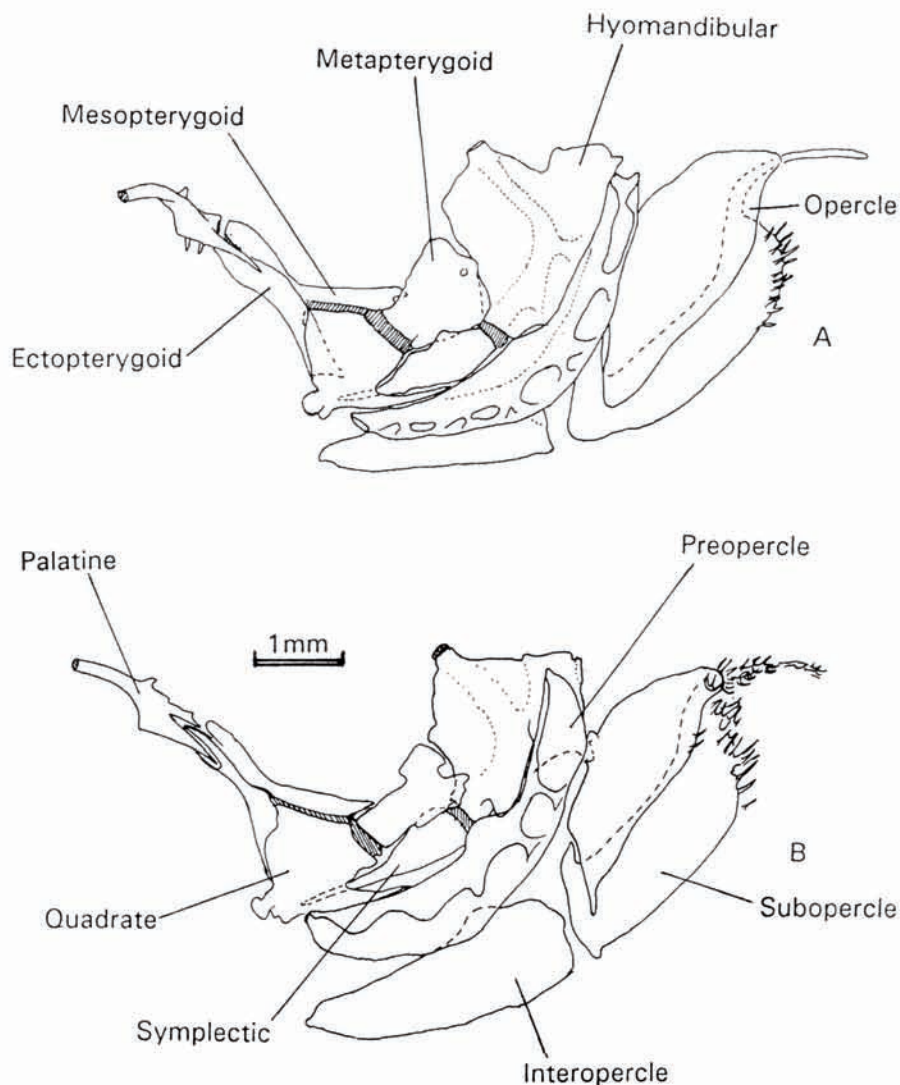


Fig. 4. - Opercular series of A) *Acanthanectes hystrix* and B) *A. rufus* showing spines on opercle and subopercle (Hatching denotes cartilage.)

***ACANTHANECTES HYSTRIX* SP. NOV.**

(Figs. 5, 6, Table I)

Diagnosis

A species of *Acanthanectes* with 5 conspicuous, irregular, dark body bars, the darkest across the caudal peduncle, 18 or 19 anal-fin rays and lateral branching spinelets on all dorsal-fin elements as well the pectoral fin-rays.

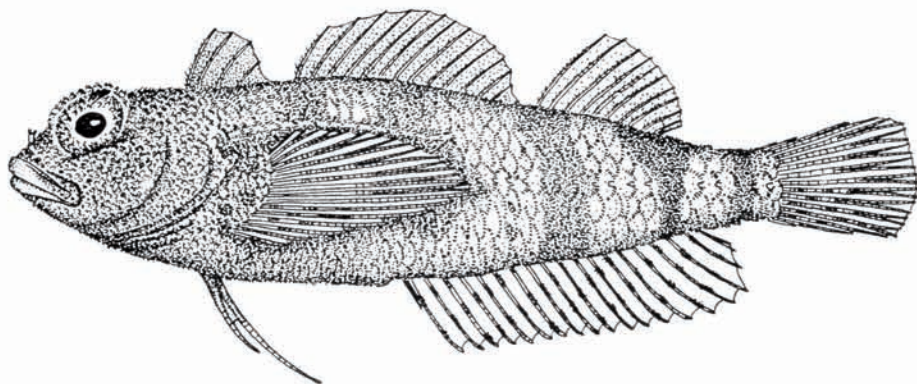


Fig. 5. - *Acanthanectes hystrix*. Holotype, RUSI 36688, male, 31.3 mm SL.

Description

Dorsal fins IV + XII-XIV + 9-10 (IV + XIII + 10), last spine very short and last ray divided to its base; first dorsal fin lower than second and second lower than third. Small lateral spinelets on spines and rays of all dorsal fins. Anal fin I + 17-19, usually 18 rays (I + 19), last ray divided to its base. Pelvic fins with one short, hidden spine and two slender rays, the longest not reaching the vent, united by membrane for half the length of the shorter ray. Pectoral fins with 16 (few with 15) rays, upper one and lower 7 undivided, remainder divided once; all pectoral rays with lateral branching spinelets. All spines and rays slender.

Lateral-line anterior series with 15-18 (16) pored scales, posterior series with 19-22 (22) notched scales, last scale on base of caudal fin not notched and not counted; one scale row between them; total lateral scales 34; transverse scales 3/7. Body covered with ctenoid scales with stout ctenii, extending onto base of caudal fin, the scales not lying flat, but presenting a coarse, 'pineapple-like' appearance. Scalation irregular, with small scales inserted particularly between scales of upper two rows. Head rough in appearance, with small embedded 'scales' on cheeks bearing vertical ctenii. Belly with small ctenoid scales extending from vent to base of pelvic fins. Ctenoid scales on upper opercle and pectoral-fin base.

Head broad and blunt, snout profile 72°-77°. Head, snout and perimeter of eyes papillose with spines imbedded in the papillae, the tips of the spines protruding. Multifid orbital and anterior nasal tentacles present. Cheeks and opercles with small, modified scales with few upturned ctenii. Mouth downturned, maxilla extending to vertical from anterior margin of pupil. Interorbital wide, about half diameter of eye, deeply concave in adults giving prominent 'brow-ridges' and a 'pop-eye' appearance. Teeth conical, in band in upper and lower jaws, largest in single row on outer margin of upper premaxilla and slightly recurved; single row of 7 or 8 stout teeth on vomer, palatines with 2 or 3 stout teeth. Mandibular pore pattern 3 + 2 + 3 (Fig. 7). Infraorbital canal a single, unbranched canal running behind and below eye.

Precaudal vertebrae 11, caudal vertebrae 23 or 24; 9 pleural ribs, 11 epipleural ribs. Caudal fin with 6 + 7 principal rays, upper- and lowermost undivided, remainder divided once, and 6 dorsal and 5 ventral procurent rays.

Colour

Both sexes with 4 or 5 dark bars across the body, the darkest across the caudal peduncle. Body ground colour pale grey. In life these bars are deep orange peppered with melanophores. The anterior 2 or 3 bars may not reach the base of the anal fin. Margins of

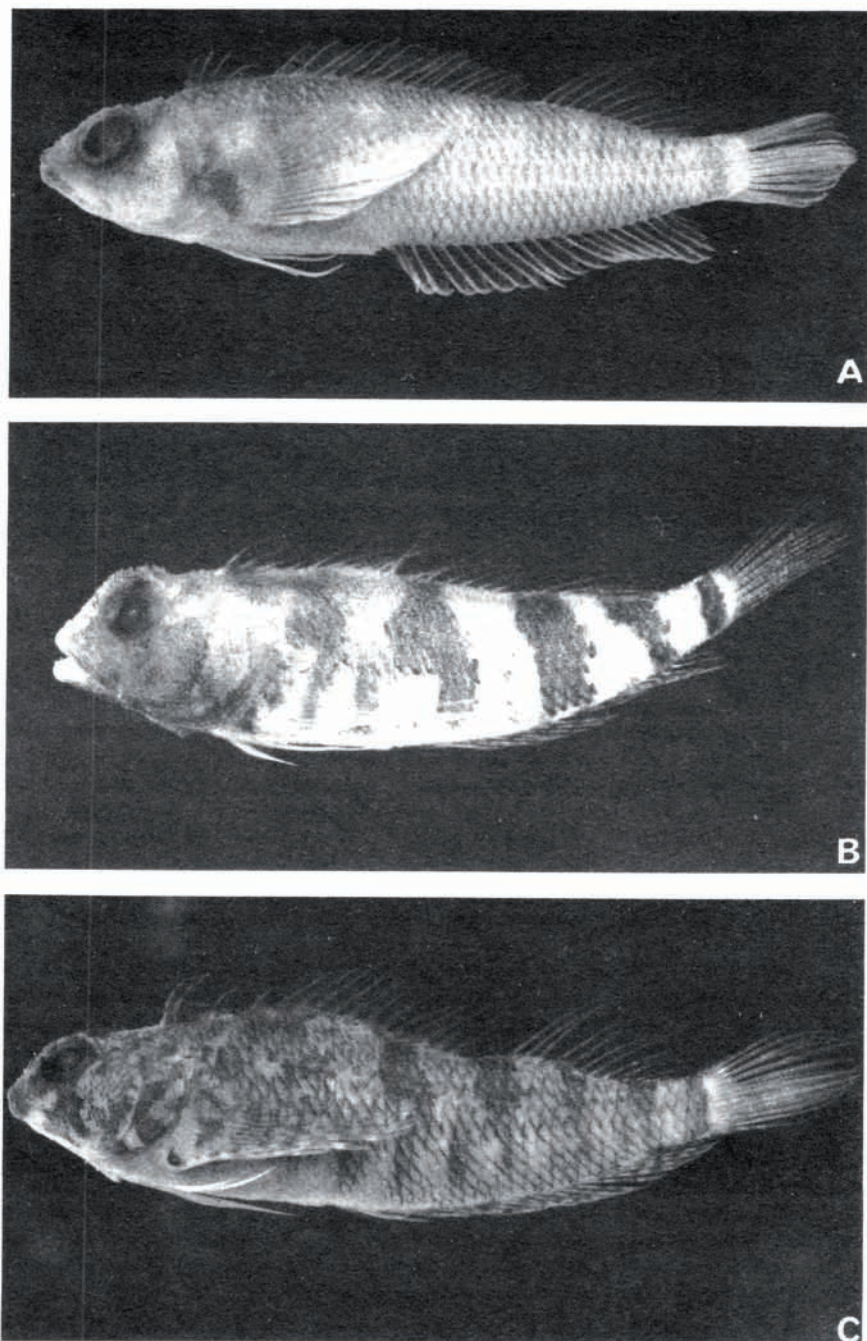


Fig. 6. - A) *Acanthanectes rufus*, holotype (35.5 mm SL); B) *A. hystrix*, holotype (31.3 mm SL); C) *Creminochorites capensis* (38.0 mm SL) from the Tsitsikamma coast.

Table 1. - Morphometrics and meristics of selected specimens of *Acanthanectes hystrix* and *A. rufus*.

	<i>Acanthanectes hystrix</i>										<i>Acanthanectes rufus</i>									
	Holotype	Paratypes									Holotype	Paratypes								
		RUSI 36688	NMNZ P.29420	RUSI 36692	RUSI 36694	RUSI 36697	RUSI 36697	RUSI 36697	RUSI 36697	USNM 326000		RUSI 36689	RUSI 36700	RUSI 36701	RUSI 36701	RUSI 36703	RUSI 36703	RUSI 36703	USNM 326001	
Standard length	31.3	28.5	24.3	29.2	30.5	26.3	35.0	35.0		35.5	28.3	31.7	32.5	28.7	28.6	30.5				
Head length	9.7	8.4	7.4	8.7	9.6	8.3	10.5	10.5		10.8	8.5	9.7	9.7	8.8	9.0	9.4				
Eye diameter	2.8	2.7	2.4	2.6	2.9	2.4	2.9	2.9		3.0	2.6	2.8	2.7	2.6	2.6	2.8				
Maxilla length	4.4	3.3	2.8	3.4	3.8	3.5	5.0	5.0		5.1	3.5	4.3	4.5	3.9	3.8	3.9				
Snout length	2.4	2.2	1.5	2.2	2.4	1.7	2.7	2.7		2.4	2.0	2.5	2.3	2.2	2.0	2.2				
Snout profile	73°	77°	74°	77°	-	-	74°	74°		63°	65°	63°	-	65°	-	65°				
First dorsal	IV	IV	IV	IV	IV	IV	IV	IV		IV	IV	IV	IV	IV	IV	IV				
Second dorsal	XIII	XIV	XIII	XIII	XIII	XIII	XIII	XIII		XV	XIV	XIV	XIV	XV	XV	XV				
Third dorsal	10	10	10	9	9	9	9	9		10	10	10	10	10	10	10				
Anal fin	I, 19	I, 18	I, 17	I, 18	I, 18	I, 18	I, 18	I, 18		I, 21	I, 21	I, 21	I, 21	I, 21	I, 21	I, 21				
LL pored scales	16	-	-	17	15	15	15	15		15	16	17	16	15	-	14				
LL notched scales	22	-	-	20	20	21	19	19		22	23	23	22	22	-	24				
Precaudal vertebrae	11	11	11	11	11	11	11	11		11	11	11	11	11	11	11				
Caudal vertebrae	23	22	23	23	23	24	23	23		25	25	25	25	24	24	24				

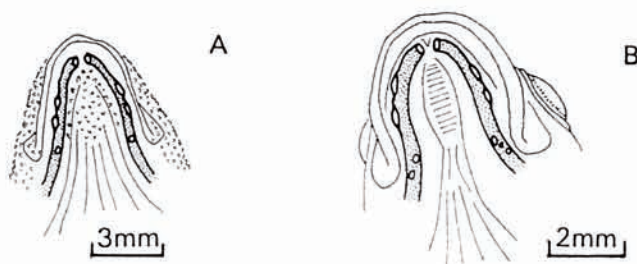


Fig. 7. - Mandibular pore patterns of A) *A. hystrix* and B) *A. rufus*.

the scale pockets between bars orange-yellow. Dorsal and pectoral fins of males with orange bars bordered by a line of melanophores on membranes; anal fin with narrow bars of melanophores on the elements only, membranes orange-yellow behind bars. Dorsal fins of females with irregular bars, melanophores on elements only, orange on membranes; anal fin as in males. Caudal-fin bars least prominent, often absent in small individuals and females. Head and face of mature males (> 30 mm) orange with many evenly spread small melanophores, except for tip of snout and lips which are bright orange. First dorsal fin, orbital tentacle and pectoral-fin base very dark. Head of females patterned with bands of melanophores on a paler orange background, particularly below eyes, on lips and cheeks, as well as on pectoral-fin base. In preservative all colour fades.

Etymology

The specific name *hystrix*, the generic name for the African porcupine, refers to the fish's prickly appearance. It is to be considered a noun in apposition.

ACANTHANECTES RUFUS SP. NOV.

(Figs 6, 8, Table I)

Diagnosis

A species of *Acanthanectes* light red in colour in life with 5 or 6 pale, narrow saddle bands across the dorsum, 21 or 22 anal-fin rays and lateral branching spinelets only on spines of first two dorsal fins.

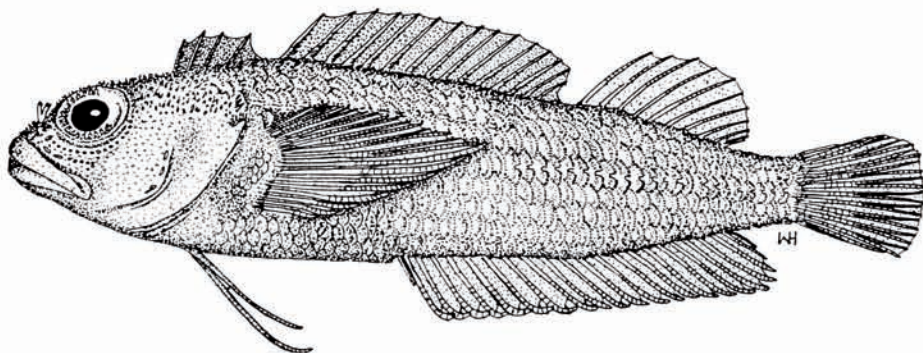


Fig. 8. - *Acanthanectes rufus*. Holotype, RUSI 36689, male, 35.5 mm SL.

Description

Dorsal fins IV + XIV-XV + 10-11 (IV + XV + 10), last spine short and last ray divided to its base; first two dorsal fins low, the first about two-thirds height of second; dorsal-fin spines with lateral branching spines. Anal fin I + 21-22 (I + 21), last ray divided to its base; pelvic fin with one short, hidden spine and two slender rays, the longer not reaching the vent, united by membrane for quarter the length of the shorter ray. Pectoral fins with 17 (few with 16) rays, upper one undivided, lower 8 (or 7) thickened and unbranched, remainder divided once; caudal fin 7 + 6 principal rays, upper and lowermost undivided, remainder divided once, and 6 dorsal and 5 ventral procurent rays.

Lateral-line anterior series of 15-17 (15) pored scales, posterior series of 22 or 23 (23) notched scales, one scale row between them; total lateral scales 34 or 35; transverse scales 4/8. Body covered with ctenoid scales with long ctenii, extending onto base of caudal fin, the scales not lying flat and presenting a coarse, 'pineapple-like' appearance. Belly with cycloid scales, extending from vent to base of pelvic fins. Few ctenoid scales on upper opercle and upper pectoral-fin base, pectoral-fin axil with cycloid scales.

Head fairly blunt, snout profile 63°-65°. Head, snout, interorbital, and perimeter of eye papillose, each papilla with a soft 'spine' embedded in it, those on the head ankylosed to the skull. Anterior nasal tentacles long and multifid; orbital tentacles absent. Mouth down-turned, maxilla extends to vertical through middle of pupil. Interorbital wide, about half diameter of eye. Teeth coniform, depressible, in band in upper and lower jaws, largest in single row on outer margin; single row of teeth on vomer, palatines edentate. Mandibular pore pattern 4 or 5 + 2 + 4 or 5 (Fig. 9). Very complex arrangement of sensory canals branching from infraorbital canal over preopercular area, each with two rows of many small pores (Fig. 10).

Precaudal vertebrae 11, caudal vertebrae 24 or 25; pleural ribs 11, epipleural ribs 13; caudal fin with 6 + 7 principal rays, upper- and lowermost simple, remainder divided once, and 6 dorsal and 5 ventral procurent rays.

Colour

Both males and females pale orangy-red when alive with 5 or 6 pale, narrow, saddle bands extending to the midline. Margins of scale pockets with band of small melanophores. Prominent dark cluster of melanophores on lower margin of pectoral fin base, larger in males than in females. Tip of lips and snout with small melanophores. Dark blotch below eye. Large males with even scatter of melanophores on dorsal-, caudal- and anal-fin membranes, spines and rays without markings. In alcohol the colour soon fades.

Etymology

The specific name is adjectival and is given for the species' reddish colour.

Comparisons

Besides the different colour patterns, the two species of *Acanthanectes* differ in many other respects as well. *A. hystrix* is a more robust fish with a broader, heavier head. Fin spinelets, which in *A. rufus* are confined to the first two dorsal fins, are also found on the third dorsal and pectoral fins. The cranial osteology of the two species also differs considerably. In both species the septal is ossified, but in *A. hystrix* cartilage lies between the septal and parasphenoid, which extends back to between the basisphenoid and parasphenoid. *A. rufus* lacks a basisphenoid; it is much reduced in *A. hystrix* and articulates only with a posterior extension of what may be termed a septal cartilage and not with the parasphenoid or pterosphenoids (Fig. 9). *A. rufus* has much heavier branchiostegal rays, the sixth bearing spines on the distal ventral margin. The interopercle of this species is relatively large and is larger than the opercle. *A. rufus* also lack the few palatine teeth present in *A. hystrix*. *A. hystrix* lacks entirely the complex sensory canals found on the cheeks of *A. rufus*, but has modified scales on the cheeks very similar to

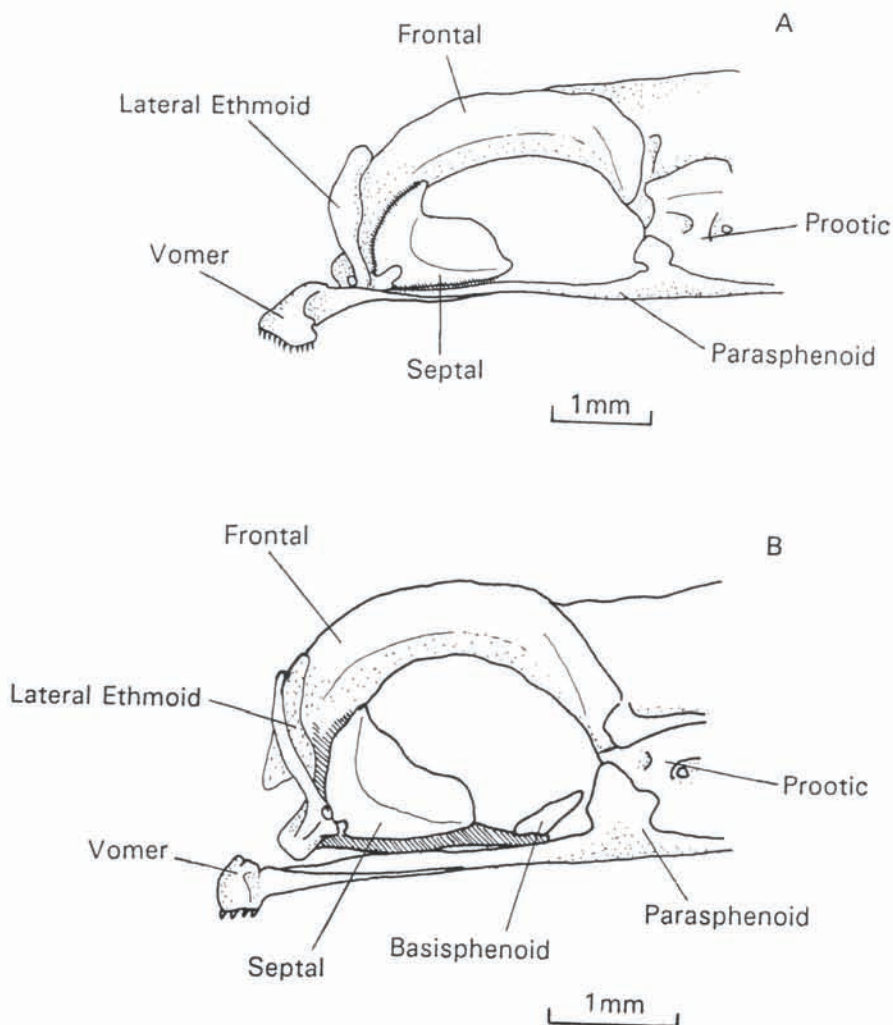


Fig. 9. - Anterior portion of skull of A) *Acanthanectes hystrix* and B) *A. rufus*. Note reduced basisphenoid of *A. hystrix* and cartilage which lies between the septal and parasphenoid, extending posteriorly to between basisphenoid and parasphenoid. (Hatching denoted cartilage.)

those of *Cremnochorites capensis*. The cheeks of *A. rufus* are papillose with slender spines embedded in the papillae. Similar papillae, often branched, are found on the upper margins of the orbits.

RELATIONSHIPS

There is little published work on tripterygiid interrelationships. Rosenblatt (1959) divided the family into two subfamilies on the basis of the two forms of the lateral line. He also made an assessment of the relationships of the species of *Enneanectes* (Rosenblatt, 1960), but neither of these analyses were based on a phylogenetic assessment

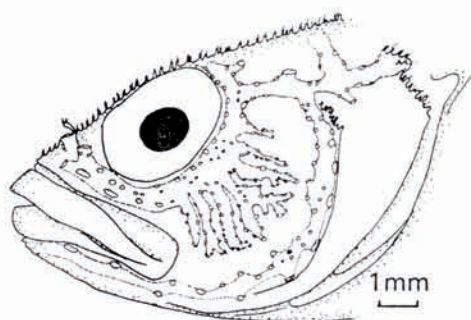


Fig. 10. - Cheek sensory canals and associated pores of *A. rufus*.

of the characters involved. There is, thus, little idea of what among tripterygiids constitute primitive or derived characters. The sister group of the Tripterygiidae is also unknown; it may be the Clinidae. The Clinidae appear to have in common with the Tripterygiidae the apparent forward movement of the anteriormost spines of the dorsal fin so that the first pterygiophores lie forward of the first vertebra (as is also found in some Labrisomidae and Blenniidae).

The form of the lateral line in a generalised perciform such as *Morone americana* (Fig. 11A) consists of a single row of pored scales running along mid-body and to the base of the caudal fin. In the Clinidae (Fig. 11B) the lateral line curves down at about half body-length and may continue onto the caudal peduncle, as it may in some Blenniidae, Dactyloscopidae and Labrisomidae. In one group of tripterygiid genera the lateral line consists of a series of pored scales which runs in a concave curve down from the shoulder to the midline and stops between mid-body and the caudal peduncle (Fig. 11C). This is considered derived from the generalised perciform lateral line (V.G. Springer pers. comm.) which runs with a gentle convex curve, about parallel with the dorsum, to the base of the caudal fin. The alternate form is a discontinuous lateral line, divided into two portions, an anterior series of pored scales and a posterior series of notched scales (Fig. 11D), which is also considered derived. Thus each of the two subfamilies possess a derived lateral line that appears to have evolved independently. Rosenblatt (1959) named the two subfamilies the Lepidoblenniinae (continuous lateral line - Fig. 11C) and the Tripterygiinae (discontinuous lateral line - Fig. 11D). The two subfamilies may be found to have other derived characters.

Within each of these subfamilies many genera have been shown to be clearly monophyletic, e.g. *Helcogramma* (Hansen, 1986), *Forsterygion* and *Obliquichthys* (Hardy, 1987) and *Cremnochorites* and *Ceratobregma* (Holleman, 1982, 1987). *Acanthanectes* has two autapomorphies that distinguish it from all other genera: the spines on the subopercles, and the reduction or loss of the basisphenoid. The lateral branching spinelets on the fin elements and spines ankylosed to the top of the skull are clearly also derived characters and shared between *Acanthanectes* and *Cremnochorites* (Fig. 3C); *Cremnochorites* carries spinelets on the spines of the first dorsal fin only. Based on these characters *Acanthanectes* and *Cremnochorites* are considered sister genera. However, these two characters are also found in the New Zealand endemic *Notoclinops coeruleopunctatus*, but not in the other two species in this genus, *N. segmentatus* and *N. yaldwyni*. *Notoclinops* also has four first dorsal- and a single anal-fin spine. Because of the spinelets, the spines fixed to the skull, the form of the mandibular sensory canal and a 'U'-shaped supratemporal sensory canal, Hardy (1989) was unsure of the generic affinity of *coeruleopunctatus*, placing it in *Notoclinops* on the basis of shared fin spine counts and a divided lateral line. It is possible that *N. coeruleopunctatus* has closer affinity to *Acanthanectes* and *Cremnochorites* than it has to other *Notoclinops* species, but until a cladistic analysis has been done, these relationships must remain unresolved.

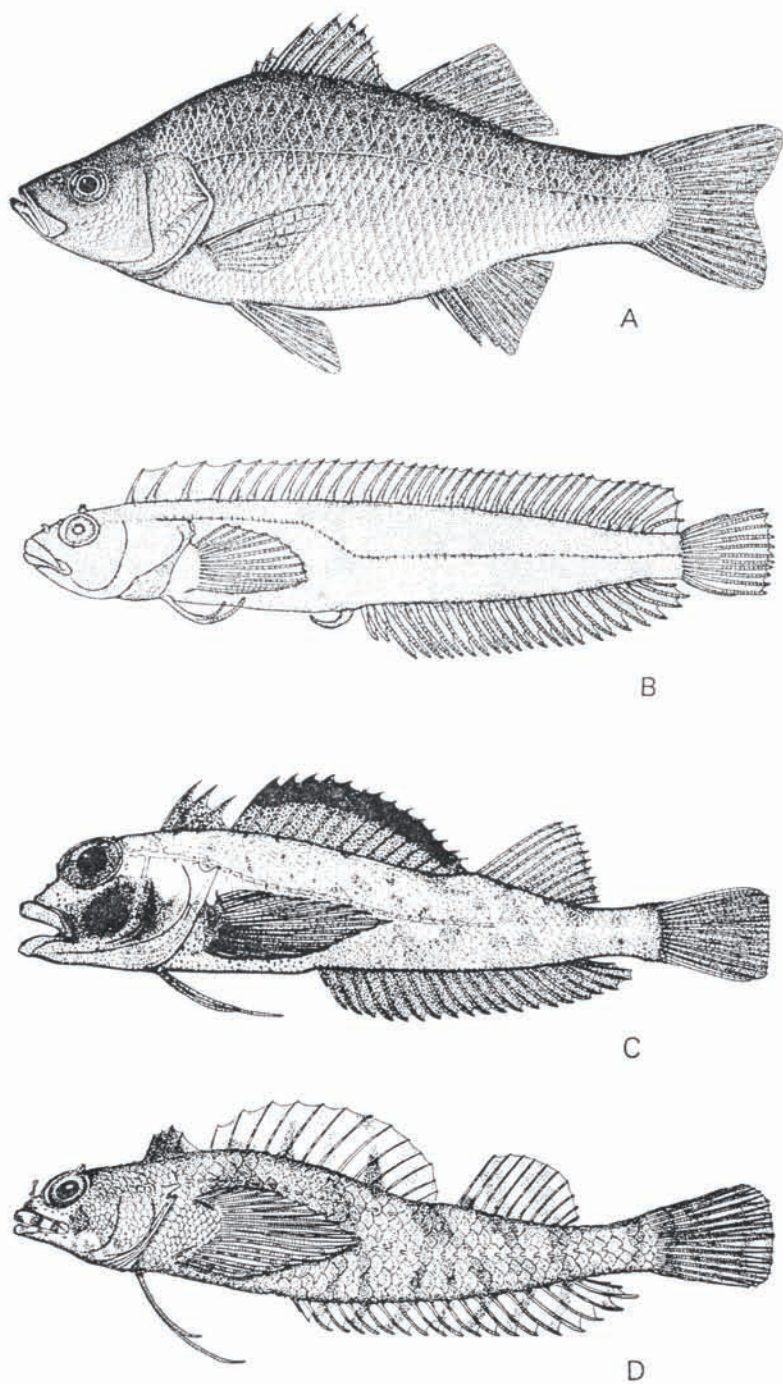


Fig. 11. - A) *Morone americana* (from Scott and Crossman, 1973); B) *Clinus naualis* (from Penrith, 1969); C) *Helcogramma fuscipinna*; D) *Norfolkia brachylepis*.

ECOLOGICAL NOTES

All of the specimens were collected using the ichthyocide rotenone, from reefs at depths greater than 10 m. Typically the reef at this depth has a low to medium relief and the substratum cover is characterised by encrusting, sessile, filter-feeding invertebrates. These include ascidians, sponges, bryozoans and octocorals. Ichthyofaunal surveys (Buxton and Smale, 1984; Burger, 1990) show that this reef type supports a diverse assemblage of cryptic ichthyofauna, including one other tripterygiid, *Cremnochorites capensis*. This species is very abundant on shallow reefs between 5 and 12 m, making up 32% of the cryptic ichthyofauna (Burger, 1990).

In a study of the diet of cryptic fishes in the Tsitsikamma, Burger (1990) found that *C. capensis* was a benthic carnivore, feeding on small crustaceans, mainly amphipods and isopods. Insufficient material was available for a comparative study of the diet of the other two species, but from the functional morphology of the jaw and from material in the stomachs of cleared and stained specimens, it would seem that the diet was not remarkably different. The very different cephalic lateralis systems of *Acanthanectes rufus* and *A. hystrix* begs a study on possible resource partitioning between these two species.

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